Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

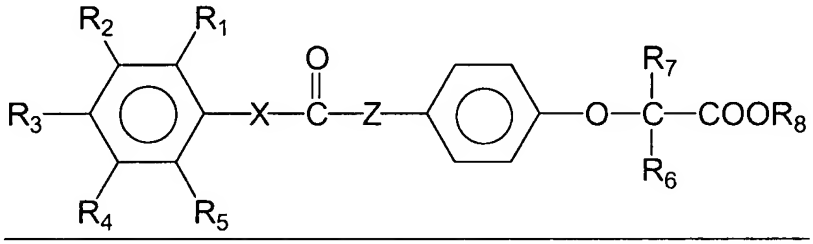
Listing of Claims:

1. (currently amended) A method for measuring a blood oxygen level-dependent magnetic resonance imaging signal, comprising

a) administering an effective amount of an allosteric effector compound capable of decreasing hemoglobin binding affinity for oxygen; and

b) performing a blood oxygen level-dependent magnetic resonance imaging scan, whereby said blood oxygen level-dependent magnetic resonance imaging signal is measured, wherein the allosteric effector compound is a compound selected from the group consisting of: .

a compound having the formula:

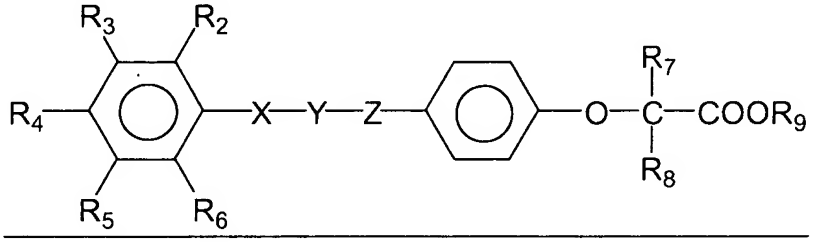


where R_{1-5} may be hydrogen, halogen, or a substituted or unsubstituted C_{1-3} alkyl group and may be the same or different,

R_{6-7} may each be hydrogen or methyl and may be the same or different, and

R_8 may be hydrogen, a substituted or unsubstituted C_{1-3} alkyl group, or a salt cation, and X and Z are CH_2, NH, or O;

a compound having the formula:



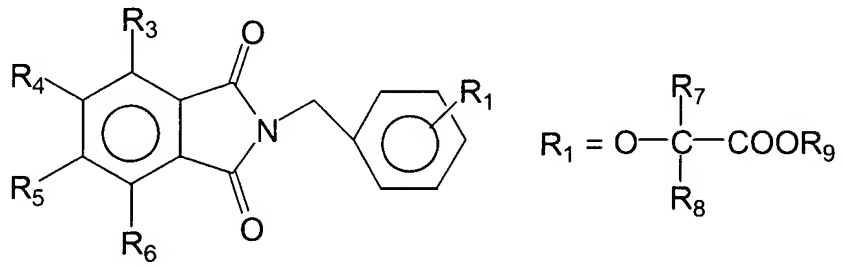
where X and Z may each be CH_2, CO, NH or O, and Y may be CO or NH, which the caveat that X, Y, and Z must all be different from each other, and

$R_{2\text{-}6}$ can be the hydrogen, halogen, substituted or unsubstituted $C_{1\text{-}3}$ alkyl groups, and may be the same or different,

$R_{7\text{-}8}$ can be hydrogens, methyls, ethyls, or alkyl groups in a ring connecting the two, and

R_9 can be a hydrogen, lower alkyl, or salt cation;

a compound having the formula:



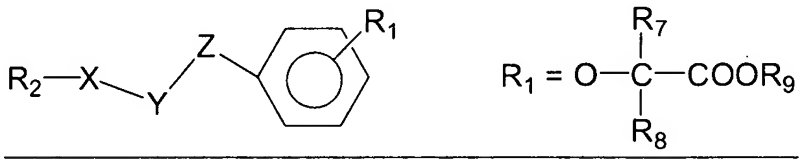
where $R_{3\text{-}6}$ can be the hydrogen, halogen, substituted or unsubstituted $C_{1\text{-}3}$ alkyl group, or a $C_{1\text{-}3}$ ether or ester, and these moieties may be the same or different, or alkyl moieties of an aromatic or aliphatic ring incorporating two of the $R_{3\text{-}6}$,

R_1 can be connected to any position on the phenyl ring, and

sites $R_{7\text{-}8}$ can be hydrogen, halogen, methyl, ethyl, and these moieties may be the same or different, or alkyl groups in a ring connecting the two, and

R_9 can be a hydrogen, halogen, $C_{1\text{-}3}$ lower alkyl, or salt cation;

a compound having the formula:



where R_1 can be connected to any position on the phenyl ring, and

sites $R_{7\text{-}8}$ can be hydrogen, halogen, methyl, ethyl, and these moieties may be the same or different, or alkyl groups in a ring connecting the two, and

R_2 is defined as a substituted or unsubstituted aromatic compound, a substituted or unsubstituted alkyl ring compound, or a substituted or unsubstituted phthalimide compound,

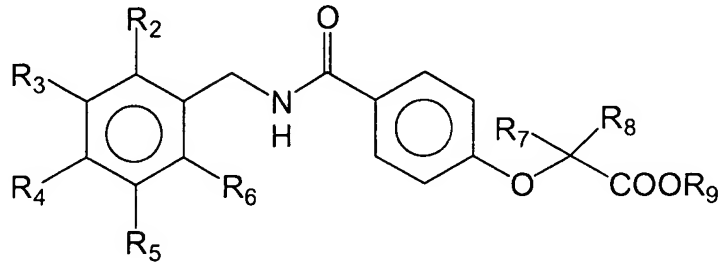
X is a carboxyl,

Y is a nitrogen,

and R_2 completes the phthalimide compound by being bonded to both X and Y; and

where X, Y, and Z, may either be CH_2, NH, O, or N, with the caveat that each are different from the other;

a compound having the formula:

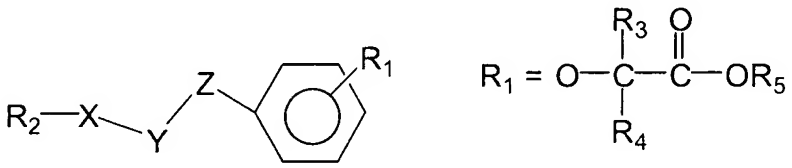


where R_2, R_3, R_4, R_5, and R_6 may be hydrogen, halogen, or alkyl groups and may be the same or different,

R_7 and R_8 may be hydrogen or methyl groups and may be the same or different, and

where the R_9 moiety is hydrogen or a salt cation;

a compound having the formula:



where R_2 is a substituted or unsubstituted aromatic compound, or a substituted or unsubstituted alkyl ring compound, or a substituted or unsubstituted phthalimide compound that incorporates X and Y,

X is a carbonyl,

Y is a nitrogen, and

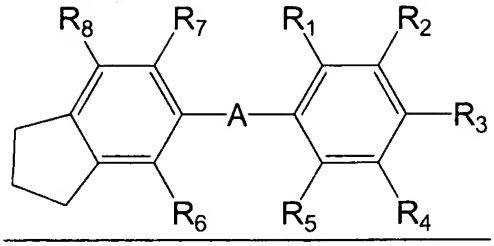
R_2 completes the phthalimide compound by being bonded to both X and Y, and where X, Y, and Z are CH_2, NH, S, SO_2, CO, O or N with the caveat that X, Y, and Z are each different from one another, and

where R_1 can be connected to any position on the phenyl ring, and

R_3 and R_4 are hydrogen, halogen, methyl, ethyl, propyl, isopropyl, neopentyl, butyl, or substituted or unsubstituted aryl groups and these moieties may be the same or different, or alkyl moieties as part of an aliphatic ring connecting R_3 and R_4, and

R_5 is a hydrogen, halogen, C_{1-3} lower alkyl, or a salt cation;

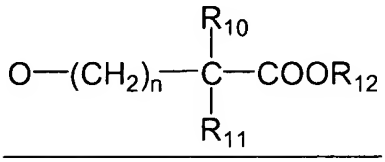
a compound having the formula:



where A is a chemical bridge which includes two to four chemical moieties bonded together,

the chemical moieties in A are selected from the group consisting of CO, O, S, SO_2, NH, NR_9 where R_9 is a C_{1-6} alkyl group, CH_2, CH, and C, with the proviso that, except in the case where A contains two identical CH and C moieties positioned adjacent one another to form an alkene or alkyne, the chemical moieties in A are each different from one another, and

at least one of R_{1-5} is substituted with a compound having the chemical formula:



where n is zero to five,

where R_{10} and R_{11} are selected from the group consisting of hydrogen, halogen, C_{1-12} alkyl groups, carboxylic acids and esters, aromatic or heteroatomic groups, and these moieties may be the same or different, or alkyl moieties of part of an aliphatic ring connecting R_{10} and R_{11}, and where R_{12} is a hydrogen, halogen, salt cation, metal, or C_{1-6} alkyl group, and

wherein a remainder of the R_{1-5} moieties and the R_{6-8} moieties are selected from the group consisting of hydrogen, halogen, C_{1-6} alkyl groups, C_{1-6} ether or esters, aromatics and heteroaromatics, and alkyl moieties of an aliphatic ring connecting two sites on a phenyl group;

a compound having the formula:

$$R_1—A—R_2$$

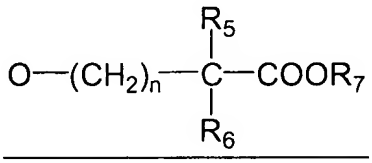
where R_1 and R_2 each are a substituted or unsubstituted aromatic or heteroaromatic compounds, or a substituted or unsubstituted alkyl or heteroalkyl ring compound, or a substituted or unsubstituted phthalimide compound, and

where R_1 and R_2 may be the same or different,

where A is a chemical bridge which includes three chemical moieties bonded together between R_1 and R_2,

wherein the chemical moieties in A are selected from the group consisting of CO, O, S, SO_2, NH, NR_3 where R_3 is C_{1-6} alkyl group, NR_4 where R_4 includes two carbonyls as part of a phthalimide compound formed with R_1 or R_2, CH_2, CH, and C, and

where at least one of R_1 and R_2 is substituted with a compounds having the chemical formula:



where n is zero to five, where R_5 and R_6 are selected from the group consisting of hydrogen, halogen, substituted or unsubstituted C_{1-12} alkyl groups, carboxylic acid and ester groups, substituted or unsubstituted aromatic or heteroaromatic groups, and these moieties may be the same or different, or alkyl moieties of part of an aliphatic ring connecting R_5 and R_6, and

where R_7 is a hydrogen, halogen, salt cation, metal, or substituted or unsubstituted C_{1-6} alkyl group;

a compound having the formula:

$$R_1—A—R_2$$

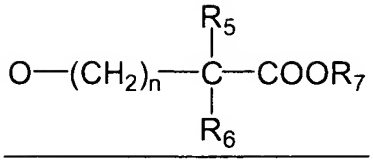
where R_1 and R_2 each are a substituted or unsubstituted aromatic or heteroaromatic compound, or substituted or unsubstituted alkyl or heteroalkyl ring compound, or a substituted or unsubstituted phthalimide compound, and

where R_1 and R_2 may be the same or different,

where A is a chemical bridge which includes two to four chemical moieties bonded together between R_1 and R_2,

wherein said chemical moieties in A are selected from the group consisting of CO, O, S, SO_2, NH, NR_3 where R_3 is a C_{1-6} alkyl group, NR_4 where R_4 includes two carbonyls as part of a phthalimide compound formed with R_1 or R_2, CH_2, CH, and C, with the caveat that, except in the case where A contains two identical CH and C moieties positioned adjacent one another to form an alkene or alkyne, the chemical moieties in A are each different from one another, and

wherein at least one of R_1 or R_2 is substituted with a compound having the chemical formula:

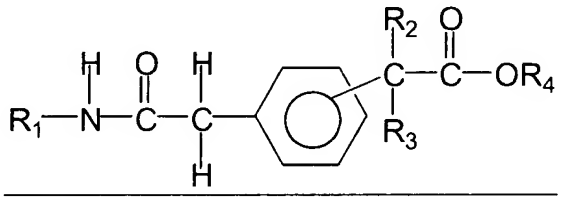


where n is zero to five,

where R_5 and R_6 are selected from the group consisting of hydrogen, halogen, substituted or unsubstituted C_{1-12} alkyl groups, carboxylic acid and ester, substituted or unsubstituted aromatic or heteroaromatic groups, and these moieties may be the same or different, or alkyl moieties of part of an aliphatic ring connecting R_5 and R_6, and

where R_7 is a hydrogen, halogen, salt cation, metal, or substituted or unsubstituted C_{1-6} alkyl group; and

a compound having the formula:



where R_1 is selected from the group consisting of optionally substituted phenyl, adamantyl, napthyl, and indanyl, R_{2-3} are alkyl moieties of a C_{3-6} alkyl ring connecting R_2 and R_3, and R_4 is a hydrogen, a monovalent salt cation, or a C_{1-3} lower alkyl.

2. (cancelled)

3. (currently amended) The method of ~~Claim 2~~ Claim 1, wherein the allosteric effector compound is administered at a dose of 100-300 mg/kg.

4. (original) The method of Claim 1, wherein the allosteric effector compound is 2-[4-(((3,5-dimethylanilino)carbonyl)methyl)phenoxy]-2-methylpropionic acid, or a physiologically acceptable salt thereof.

5. (original) The method of Claim 4, wherein the allosteric effector compound is administered at a dose of 100-300 mg/kg.

6. (original) The method of Claim 4, wherein the allosteric effector compound is administered at a dose of 200 mg/kg.

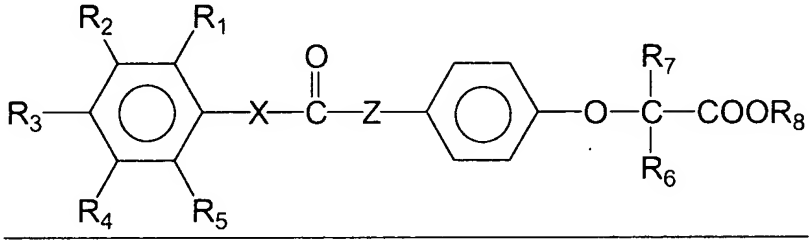
7-12. (cancelled)

13. (currently amended) A method of measuring tumor oxygenation, comprising

a) administering an effective amount of an allosteric effector compound capable of decreasing hemoglobin binding affinity for oxygen; and

b) performing a blood oxygen level-dependent magnetic resonance imaging scan, whereby oxygenation of the tumor is measured, wherein the allosteric effector compound is a compound selected from the group consisting of: .

a compound having the formula:

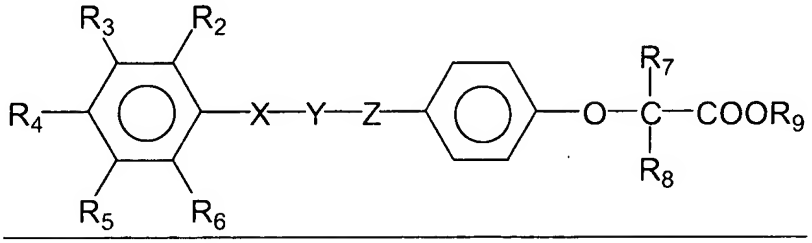


where R_{1-5} may be hydrogen, halogen, or a substituted or unsubstituted C_{1-3} alkyl group and may be the same or different,

R_{6-7} may each be hydrogen or methyl and may be the same or different, and

R_8 may be hydrogen, a substituted or unsubstituted C_{1-3} alkyl group, or a salt cation, and X and Z are CH_2, NH, or O;

a compound having the formula:



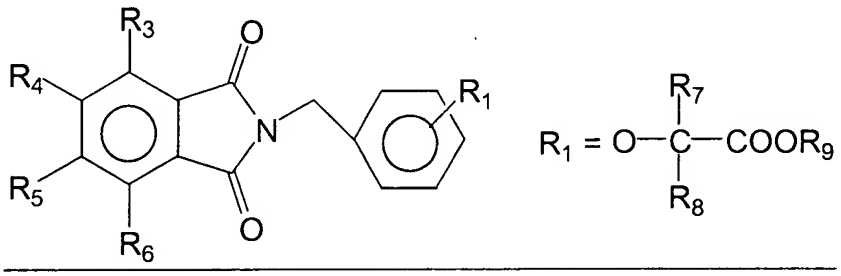
where X and Z may each be CH_2, CO, NH or O, and Y may be CO or NH, which the caveat that X, Y, and Z must all be different from each other, and

$R_{2\text{-}6}$ can be the hydrogen, halogen, substituted or unsubstituted $C_{1\text{-}3}$ alkyl groups, and may be the same or different,

$R_{7\text{-}8}$ can be hydrogens, methyls, ethyls, or alkyl groups in a ring connecting the two, and

R_9 can be a hydrogen, lower alkyl, or salt cation;

a compound having the formula:



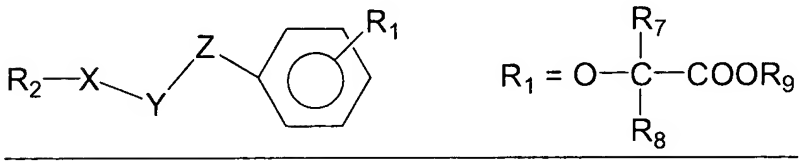
where $R_{3\text{-}6}$ can be the hydrogen, halogen, substituted or unsubstituted $C_{1\text{-}3}$ alkyl group, or a $C_{1\text{-}3}$ ether or ester, and these moieties may be the same or different, or alkyl moieties of an aromatic or aliphatic ring incorporating two of the $R_{3\text{-}6}$,

R_1 can be connected to any position on the phenyl ring, and

sites $R_{7\text{-}8}$ can be hydrogen, halogen, methyl, ethyl, and these moieties may be the same or different, or alkyl groups in a ring connecting the two, and

R_9 can be a hydrogen, halogen, $C_{1\text{-}3}$ lower alkyl, or salt cation;

a compound having the formula:



where R_1 can be connected to any position on the phenyl ring, and

sites $R_{7\text{-}8}$ can be hydrogen, halogen, methyl, ethyl, and these moieties may be the same or different, or alkyl groups in a ring connecting the two, and

R_2 is defined as a substituted or unsubstituted aromatic compound, a substituted or unsubstituted alkyl ring compound, or a substituted or unsubstituted phthalimide compound,

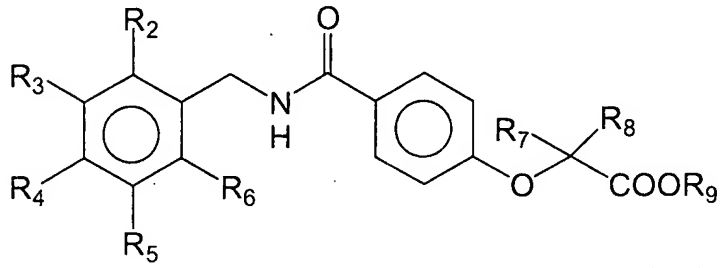
X is a carboxyl,

Y is a nitrogen,

and R_2 completes the phthalimide compound by being bonded to both X and Y; and

where X, Y, and Z, may either be CH_2, NH, O, or N, with the caveat that each are different from the other;

a compound having the formula:

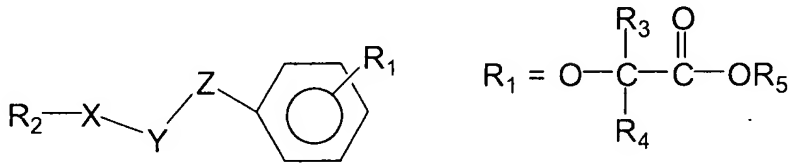


where R_2, R_3, R_4, R_5, and R_6 may be hydrogen, halogen, or alkyl groups and may be the same or different,

R_7 and R_8 may be hydrogen or methyl groups and may be the same or different, and

where the R_9 moiety is hydrogen or a salt cation;

a compound having the formula:



where R_2 is a substituted or unsubstituted aromatic compound, or a substituted or unsubstituted alkyl ring compound, or a substituted or unsubstituted phthalimide compound that incorporates X and Y,

X is a carbonyl,

Y is a nitrogen, and

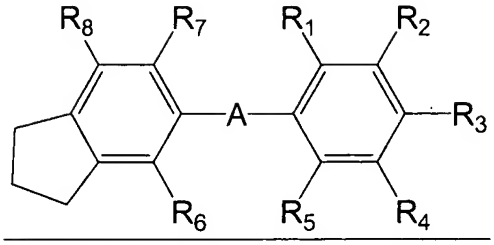
R_2 completes the phthalimide compound by being bonded to both X and Y, and where X, Y, and Z are CH_2, NH, S, SO_2, CO, O or N with the caveat that X, Y, and Z are each different from one another, and

where R_1 can be connected to any position on the phenyl ring, and

R_3 and R_4 are hydrogen, halogen, methyl, ethyl, propyl, isopropyl, neopentyl, butyl, or substituted or unsubstituted aryl groups and these moieties may be the same or different, or alkyl moieties as part of an aliphatic ring connecting R_3 and R_4, and

R_5 is a hydrogen, halogen, C_{1-3} lower alkyl, or a salt cation;

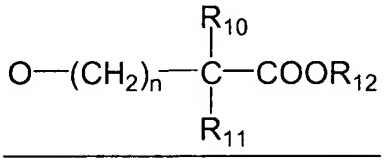
a compound having the formula:



where A is a chemical bridge which includes two to four chemical moieties bonded together,

the chemical moieties in A are selected from the group consisting of CO, O, S, SO_2, NH, NR_9 where R_9 is a C_{1-6} alkyl group, CH_2, CH, and C, with the proviso that, except in the case where A contains two identical CH and C moieties positioned adjacent one another to form an alkene or alkyne, the chemical moieties in A are each different from one another, and

at least one of R_{1-5} is substituted with a compound having the chemical formula:



where n is zero to five,

where R_{10} and R_{11} are selected from the group consisting of hydrogen, halogen, C_{1-12} alkyl groups, carboxylic acids and esters, aromatic or heteroatomic groups, and these moieties may be the same or different, or alkyl moieties of part of an aliphatic ring connecting R_{10} and R_{11}, and where R_{12} is a hydrogen, halogen, salt cation, metal, or C_{1-6} alkyl group, and wherein a remainder of the R_{1-5} moieties and the R_{6-8} moieties are selected from the group consisting of hydrogen, halogen, C_{1-6} alkyl groups, C_{1-6} ether or esters, aromatics and heteroaromatics, and alkyl moieties of an aliphatic ring connecting two sites on a phenyl group;

a compound having the formula:

$$R_1—A—R_2$$

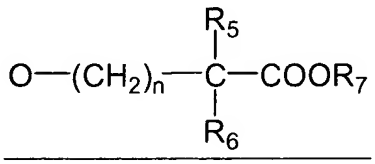
where R_1 and R_2 each are a substituted or unsubstituted aromatic or heteroaromatic compounds, or a substituted or unsubstituted alkyl or heteroalkyl ring compound, or a substituted or unsubstituted phthalimide compound, and

where R_1 and R_2 may be the same or different,

where A is a chemical bridge which includes three chemical moieties bonded together between R_1 and R_2,

wherein the chemical moieties in A are selected from the group consisting of CO, O, S, SO_2, NH, NR_3 where R_3 is C_{1-6} alkyl group, NR_4 where R_4 includes two carbonyls as part of a phthalimide compound formed with R_1 or R_2, CH_2, CH, and C, and

where at least one of R_1 and R_2 is substituted with a compounds having the chemical formula:



where n is zero to five, where R_5 and R_6 are selected from the group consisting of hydrogen, halogen, substituted or unsubstituted C_{1-12} alkyl groups, carboxylic acid and ester groups, substituted or unsubstituted aromatic or heteroaromatic groups, and these moieties may be the same or different, or alkyl moieties of part of an aliphatic ring connecting R_5 and R_6, and

where R_7 is a hydrogen, halogen, salt cation, metal, or substituted or unsubstituted C_{1-6} alkyl group;

a compound having the formula:

$$R_1—A—R_2$$

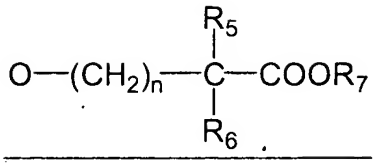
where R_1 and R_2 each are a substituted or unsubstituted aromatic or heteroaromatic compound, or substituted or unsubstituted alkyl or heteroalkyl ring compound, or a substituted or unsubstituted phthalimide compound, and

where R_1 and R_2 may be the same or different,

where A is a chemical bridge which includes two to four chemical moieties bonded together between R_1 and R_2,

wherein said chemical moieties in A are selected from the group consisting of CO, O, S, SO_2, NH, NR_3 where R_3 is a C_{1-6} alkyl group, NR_4 where R_4 includes two carbonyls as part of a phthalimide compound formed with R_1 or R_2, CH_2, CH, and C, with the caveat that, except in the case where A contains two identical CH and C moieties positioned adjacent one another to form an alkene or alkyne, the chemical moieties in A are each different from one another, and

wherein at least one of R_1 or R_2 is substituted with a compound having the chemical formula:

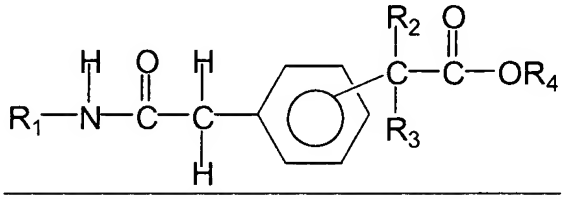


where n is zero to five,

where R_5 and R_6 are selected from the group consisting of hydrogen, halogen, substituted or unsubstituted C_{1-12} alkyl groups, carboxylic acid and ester, substituted or unsubstituted aromatic or heteroaromatic groups, and these moieties may be the same or different, or alkyl moieties of part of an aliphatic ring connecting R_5 and R_6, and

where R_7 is a hydrogen, halogen, salt cation, metal, or substituted or unsubstituted C_{1-6} alkyl group; and

a compound having the formula:



where R_1 is selected from the group consisting of optionally substituted phenyl, adamantyl, napthyl, and indanyl, R_{2-3} are alkyl moieties of a C_{3-6} alkyl ring connecting R_2 and R_3, and R_4 is a hydrogen, a monovalent salt cation, or a C_{1-3} lower alkyl.

14. (cancelled)

15. (currently amended) The method of ~~Claim 14~~ Claim 13, wherein the allosteric effector compound is administered at a dose of 100-300 mg/kg.

16. (original) The method of Claim 13, wherein the oxygenation of the tumor is measured quantitatively.

17. (original) The method of Claim 13, wherein the allosteric effector compound is 2-[4-(((3,5-dimethylanilino)carbonyl)methyl)phenoxy]-2-methylpropionic acid, or a physiologically acceptable salt thereof.

18. (original) The method of Claim 17, wherein the allosteric effector compound is administered at a dose of 100-300 mg/kg.

19. (original) The method of Claim 17, wherein the allosteric effector compound is administered at a dose of 200 mg/kg.

20-30. (cancelled)